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PROTECTIVE EFFECT OF ALCOHOLIC EXTRACT OF *ECLIPTA ALBA* ON RAT MESENTERIC MAST CELL DEGRANULATION

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ABSTRACT

The animal rat was sacrificed by ethically acceptable method and the pieces of mesentery were collected in petri dish containing Ringer Locke solution and then subjected to the following treatment schedules Vehicle control, Positive control, Dexamethasone (10 µg/mL), AEEA (100 µg/mL), AEEA (250µg/mL), AEEA (500µg/mL). Each petri dish was incubated for 10 min at 37°C and then to each petri dish, 0.1 mL of compound 48/80, a mast cell degranulator used to induce mast cell degranulation, having concentration 10 µg/mL was added and again incubated for 10 min at 37°C. After that all pieces were transferred to 4% formaldehyde solution containing 0.1% toluidine blue and kept aside for 20 mins. After staining and fixation, mesentery pieces were transferred through acetone and xylene two times and mounted on slides. All pieces were examined under light microscope with 450X magnification. Minimum of 100 cells were counted and percentage of intact and disrupted mast cells were determined. Disrupted mast cells were stained with toluidine blue and undisrupted mast cells remain as such almost round shaped. Percentage protection from degranulation of mast cells by the drug was determined. The mast cell protection in positive control group (77.666 ± 2.0923), model control group (compd 48/80 18.00 ± 1.1547), Dexamethasone group (57.8333 ± 1.7013), AEEA (100µg/mL) 31.33 ± 0.9888, AEEA (250µg/mL) 49.333 ± 1.6055, AEEA (500µg/mL) 59.333 ± 1.5634 was obtained. The protective effect of alcoholic extract of *Eclipta alba* on mast cell was obtained and was comparable to standard drug.

Key words : Dexamethasone, *Eclipta alba*, Toluidine blue

INTRODUCTION

Intensive research has highlighted the role of lymphocytes, immunoglobulins, mast cells and various autacoids in the pathogenesis of allergic conditions**.** Mast cell plays an

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important role in anaphylaxis and inflammation and has been used to test for newer agents against allergic disorders and chronic bronchial asthma. Some of the allergic disorders, which may be caused by an allergen originating from immune system, environment and by genes[1] are like asthma, eczema, hay fever, anaphylaxis, autoimmune disorders etc. Plants play a major role in the introduction of new therapeutic agents and have received much attention as sources of biologically active substances. The plant *Eclipta alba* (Linn.) Hassk [Synonym-*Eclipta prostrate* (Linn.)] (family-Asteraceae) has been mentioned in ancient texts to be a nervine tonic[2,3] in addition to hepatoprotective, hair growth promoting and anti-aging properties. The plant is reported to contain the phytoconstituents eclalbatin, alpha-amyrin, ursolic acid, oleanolic acid[4] ecliptasaponin, daucosterol, stigmasterol-3-*O*-glucoside[5] and coumestans as main active principles[6]. The plant has been extensively studied for its hepatoprotective activity and a number of herbal preparations comprising of *Eclipta alba* are available for treatment of jaundice and viral hepatitis[7-10]. The aqueous and alcoholic extracts of the plant are proved to confer protection against the myotoxic effects of snake venom[11]. Additionally, it is also reported to possess anti-nociceptive and anti-inflammatory activities. However, no investigative reports exist pertaining to its protective activity, on mast cell and hence, we decided to study the mast cell stabilization activity of the plant.

EXPERIMENTAL

Material and method

The plant material was collected from LVG (Herbal Drug Supplier), Ahmedabad, Gujarat, India. The powder was passed through 40 # sieve. The extract was prepared using Soxhlet extractor using 50% ethanol as a solvent. The extract was concentrated under controlled temperature below 50° C in porcelain dish to get the syrupy mass.

Study on rat mesenteric mast cell degranulation by compound 48/80[12]

The animal was sacrificed by ethically acceptable method and the pieces of mesentry were collected in petri dish containing Ringer Locke solution and then subjected to the following treatment schedules -

Petri Dish No. 1 : Ringer Locke solution (Vehicle control)

Petri Dish No. 2 : Ringer Locke solution (Positive control)

Petri Dish No. 3 : Dexamethasone (10 µg/mL)

Petri Dish No. 4 : Alcoholic extract of *Eclipta alba* (100 µg/mL)

Petri Dish No. 5 : Alcoholic extract of *Eclipta alba* (250 µg/mL)

Petri Dish No. 6 : Alcoholic extract of *Eclipta alba* (500 µg/mL)

Each petri dish was incubated for 10 min at 37°C and then to each petri dish, 0.1 mL of compound 48/80, a mast cell degranulator used to induce mast cell degranulation, having concentration 10 µg/mL was added and again incubated for 10 min at 37°C. After that all pieces were transferred to 4% formaldehyde solution containing 0.1% toluidine blue and kept aside for 20 to 25 min. After staining and fixation, mesentery pieces were transferred through acetone and xylene two times and mounted on slides. All the pieces were examined under light microscope with 450X magnification. Minimum of 100 cells were counted and percentage of intact and disrupted mast cells were determined. Disrupted mast cells were stained with toluidine blue and undisrupted mast cells remained as such, almost round shaped. Percentage protection from degranulation of mast cells by the drug was determined. Statistical analysis was carried out with Student's t-Test.

RESULTS AND DISCUSSION

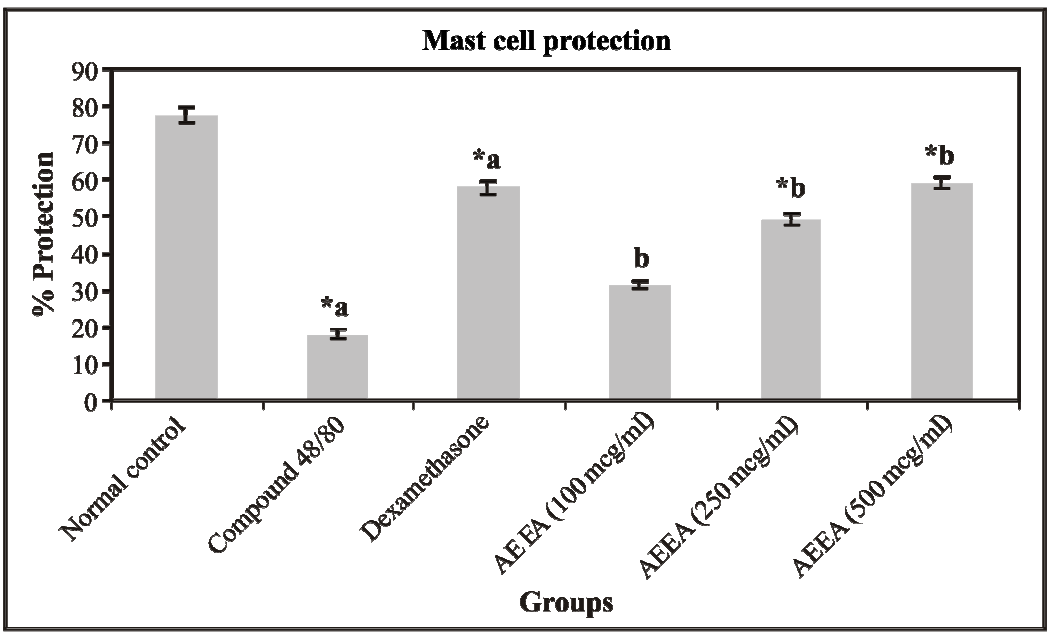

Fig. 1 : The effect of alcoholic extract of *Eclipta alba* leaves on rat mesenteric mast cell degranulation by compound 48/80

*$p < 0.05$, when compared with control, n = 6 in each group.

a – Model group compared with normal control group.

b – Model group compared with treatment group.

It is well known that mast cells are extensively involved in the pathophysiology of bronchial asthma. Mast cell disruption is mediated by activation of IgE antibodies. Sodium cromoclycate and nedocromil are important agents for the drug therapy of bronchial asthma and stabilization of mast cell membrane is the major mechanism responsible for their effectiveness. They act by reducing the synthesis and release of several pro-inflammatory cytokines. The alcoholic extract of *Eclipta alba* was found to be effective in chemically induced mast cell degranulation in dose dependent manner, so it is useful in the allergic condition, where degranulation of mast cells occurs. This suggests that the alcoholic extract of *Eclipta alba* is useful in allergic conditions, asthma.

CONCLUSION

Eclipta alba is having potential to inhibit allergic reaction induced by immunological as well as chemical stimuli. The protective effect of alcoholic extract of *Eclipta alba* on mast cell was obtained and was comparable to standard drug.

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